Department of Pesticide Regulation

Mary-Ann Warmerdam
Director

MEMORANDUM

Arnold Schwarzenegger
Governor

TO: Chuck Andrews, Chief
Registration Branch

FROM: John S. Sanders, Ph.D., Chief
Environmental Monitoring Branch
(916) 324-4155

DATE: August 29, 2007

SUBJECT: AMENDED REQUEST TO PLACE CERTAIN FUMIGANTS INTO REEVALUATION

In a memorandum dated May 21, 2007, the Environmental Monitoring Branch recommended certain fumigants be placed into reevaluation because as volatile organic compounds (VOCs) they contribute to the formation of ground-level ozone. Based on the comments received on our proposed fumigant VOC regulations and further staff discussions, the Environmental Monitoring Branch amends its recommendations.

Comments on the Proposed Regulations

Several commentors suggested that the Department of Pesticide Regulation account for reactivity in its estimates of VOC emissions and emission reduction measures. Reactivity refers to the ability of a specific VOC to create ozone. A more "reactive" pesticide will create much more ozone than a less "reactive" pesticide, on a pound per pound basis. For example, one pound of 1,3-dichloropropene will create orders of magnitude more ozone than one pound of methyl bromide, all other factors being equal. Carter (2007) has determined the reactivity for the primary fumigants. However, the registrants may disagree with the methodology employed by Carter. Additionally, some inert ingredients or breakdown products may have unknown reactivity.

Several people commented on the inadequacies of the proposed soil moisture and irrigation requirements. Comments included dissatisfaction with soil moisture restrictions and measurements; pre- and post-irrigation requirements; lack of distinction between soil types; and lack of distinction between fumigation depths.

Amended Request for Reevaluation

Pursuant to Title 3, California Code of Regulations (3CCR) sections 6220 and 6221(a), (b), and (d), the Environmental Monitoring Branch staff request that the following fumigants: methyl bromide, 1,3-dichloropropene, chloropicrin, metam-sodium, metam potassium, dazomet, and sodium tetrathiocarbonate be placed into reevaluation. Title 3CCR section 6221(a) identifies public or worker health hazard as a criterion for reevaluation; 3CCR section 6221(b) identifies

environmental contamination as a criterion; and 3CCR section 6221(d) identifies fish or wildlife hazard as a criterion.

The Environmental Monitoring Branch recommends that field fumigant registrants be required to provide the following:

- Data quantifying how application methods impact product emissions
- Data quantifying how soil moisture and irrigation regimes impact product emissions
- Monitoring of representative applications to demonstrate the accuracy of emission estimates
- Data on the reactivity of the active ingredient(s), inert ingredients that are VOCs, and any VOC breakdown products that make up at least 5% of the applied product mass

If you have any questions regarding this request, please feel free to contact me.

dpr Department of Pesticide Regulation

Mary-Ann Warmerdam
Director

MEMORANDUM

Arnold Schwarzenegger
Governor

TO: Chuck Andrews, Chief
Registration Branch

FROM: John S. Sanders, Ph.D., Chief
Environmental Monitoring Branch
(916) 324-4155

DATE: May 21, 2007

SUBJECT: REQUEST TO PLACE CERTAIN FUMIGANTS INTO REEVALUATION

Basis of Request

Pesticide volatile organic compounds (VOCs) contribute to the formation of ground-level ozone, which is harmful to human health and vegetation when present in high concentrations. The federal Clean Air Act requires each state to submit a state implementation plan (SIP) for achieving and maintaining federal ambient air quality standards, including the ozone standard. Fumigants are among the highest pesticide VOC contributors due to both their high levels of use and their high-emission potentials. Fumigants account for more than 50 percent of the pesticide VOC emissions in the San Joaquin Valley nonattainment (NAA) area, 80 percent in the Southeast Desert NAA area, and 90 percent in the Ventura NAA area. Additional data relating to the use of the fumigant products is essential to the formulation of regulatory measures to reduce VOC emissions from fumigant use and mitigate the associated detrimental impact on human health and the environment. Further, it is needed to facilitate meeting the state's obligations under SIP.

Background

In accordance with the Department of Pesticide Regulation's (DPR's) SIP, DPR maintains an inventory of pesticide VOC emissions for the May–October ozone season for specified ozone NAA areas of the State. SIP specifies certain emission reductions to be achieved, and the reductions are expressed as some percentage of the 1990 base year emissions. For the purposes of the inventory, DPR has historically assumed 100 percent of applied fumigants volatilize to the air. However, field-monitoring data shows that fumigant emissions are less than 100 percent and vary with application method. Therefore, staff requires measured emission data to quantify actual emissions and thereby improve the accuracy of emission estimates.

Establishing the most accurate VOC emission values for fumigant applications is important for two reasons. First, it is important for DPR's emission inventory to be as accurate as possible because pesticide use/management decisions are based upon the findings presented in the inventory. Second, DPR is currently considering two regulation strategies to achieve pesticide VOC reductions from fumigants in air quality NAA areas. One strategy is to require use of

"low-emission" fumigant application methods and/or prohibit certain "high-emission" fumigant application methods. A second strategy is to establish limits on VOC emission from fumigants within NAA areas. Regulations that incorporate one or both of these strategies will go into effect in 2008.

The attached memorandum by Research Scientists Dr. Terrell Barry, Dr. Frank S. Spurlock, and Randy Segawa, Agriculture Program Supervisor, describes data that is currently available for specific fumigants and also outlines areas where data are limited. This memorandum serves as the basis for this request to place all pesticide products intended for use in field fumigation and containing the following active ingredients into reevaluation: methyl bromide, 1,3-dichloropropene, chloropicrin, metam-sodium, metam-potassium, dazomet, and sodium tetrathiocarbonate.

There are generally three types of data that may be required for the above fumigants to meet SIP goals, depending on the specific fumigant:

1. Method Use Fraction (MUF) data. Because different types of application methods yield different total fractions of emissions that eventually volatilize, inventory calculations must account for the fraction of different applications of different fumigants that occur in each NAA. These fractions of application type for each fumigant in each NAA are called MUFs, and MUF estimates are used for current years as well as the 1990 base year to determine SIP compliance. DPR's current estimates are approximate and need additional refinement.

2. Application Method Adjustment Factors (AMAF) data. Different application methods yield different fraction of applications emitted as VOCs. DPR has data for some types of fumigant/application method combinations, but numerous other fumigant/application method AMAFs that have been proposed in DPR's memorandum are based on estimates or professional judgment (Barry et al., 2007), and additional data are required to improve or support these estimates. In other cases only very limited experimental data are available, so additional data are needed to improve confidence in AMAF estimates.

3. Low emission application method data. DPR has proposed modified application methods to reduce emissions. In certain cases the effectiveness of low emission methods (e.g. "watering-in") in reducing emissions is based on very limited experimental data. DPR will require additional data to support these "low emission" methods. In other cases, substantial differences in fraction of emissions have been observed between laboratory and field studies. DPR may require additional data to improve our understanding of how to bridge the gap between laboratory and field results. Finally, development of new application techniques may be required to further lower emissions.

The specific data requirements will be fumigant-specific.

Request for Reevaluation

Pursuant to Title 3, California Code of Regulations (3CCR) sections 6220 and 6221 (a), (b), and (d), the Environmental Monitoring Branch staff requests that the fumigants identified above be placed into reevaluation. Title 3CCR section (a) identifies public or worker health hazard as a criterion for reevaluation; 3CCR section (b) identifies environmental contamination as a criterion; and 3CCR section (d) identifies fish or wildlife hazard as a criterion.

The Environmental Monitoring Branch recommends that fumigant registrants be required to provide the following:

- Data quantifying how application methods impact product emissions.
- Monitoring of representative applications to demonstrate the accuracy of emission estimates.

If you have any questions regarding this request, please feel free to contact me.

Attachment